Underground Station Management System

- 6U VMEbus SBC A12
- PowerPC® MPC8245, 400 MHz
- 2 Fast Ethernet, 4 COMs
- USB, IDE, keyboard/mouse
- 3 M-Module™ slots
- UART M-Module™ M45
- 8 intelligent RS232 interfaces
- 6U VMEbus I/O card A302
- 128 binary I/Os
- RTOS VxWorks®

Large cities with a high population always have the problem of organizing mass transit efficiently. A way out is to expand or build up fully automated underground systems. An essential part is the electronics which manages the complete railway traffic as a part of a supervisory system which controls and monitors systems, subsystems and devices like building and supply systems (waste water pumps, water treatment facilities and pumps, locks), display systems, electrical trains and systems on the train, signal systems, lifts and escalators, fire monitoring and protection systems, electrical facilities, communication systems on the train (CCTV, radio etc.) or at the station and in the control center (radio, telephone etc.) and many more.

In this application the electronics described supports both local and distributed network architectures and is a part of a plant management system which acts as the interface between the supervisory system and all other subsystems. It is based on VMEbus components in double Eurocard form factor. The core of the single-board computer is a PowerPC® MPC8245 equipped with dual Fast Ethernet and four COMs. Since the requirement was to have up to 25 serial interfaces implemented on the same CPU card, the three on-board M-Module™ slots can be used to provide the additional COMs. With eight interfaces per M-Module™ even a total of 28 serial lines per single-board computer is possible. Each RS232 channel has its own FIFOs for transmitting and receiving and its own timer to monitor data reception. A total of 36 control and data lines for the eight communication channels per M-Module™ are available at a space-saving 44-pin HD-Sub connector at the front side of the board. Handling of special characters can be programmed as needed.

In some of the applications additional binary I/O is required. In that case a second 6U card with 128 optically isolated binary inputs/outputs is plugged into the VMEbus system.

These plant management systems are implemented worldwide, for example in Singapore, Hongkong, Venezuela, Chile, Taiwan, China, Marocco, Tunisia. Along the 20km route of the first application 40 CPU cards and more than 100 M-Modules™ are installed.